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A Manual of Physical Exercises

HAWKINS

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General Hawkins

Very truly Yours
John P. Hawkins

Hankins, John Parker

A MANUAL

OF

PHYSICAL EXERCISES

CALISTHENIC—MASSAGE

Intended especially for persons of sedentary occupations, and those in middle or advanced life.

From the Crown of the Head
To the Sole of the Foot

"Heaven helps those
Who help themselves."

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"Renew
The ruddy hue
Of manly blood."

"I will knead him,
I'll make him supple."
Shakespeare.

Gift
Miss A. C. Hooper
Ap 30'14

a, m, c, May 7, 14

PREFACE.

During a daily practice of calisthenic exercises for thirty years, I have formulated them into a routine, which has proved convenient in indicating such exercises of this nature as would seem sufficient for health or recreation.

I am not aware that anything has been written that presents the subject of exercise in the order and conciseness of this Primer, and it is hoped that what is here noted may satisfy the needs of most people in the way of a hand-book guide for personal use.

The exercises are especially suited for persons of sedentary occupations, and those in middle or advanced life.

JOHN P. HAWKINS,
United States Army.

Indianapolis, Indiana, 1909.

INTRODUCTION.

The purpose of this Primer is to show in a series of easy movements of the body, how one can induce a healthful circulation of the blood, with the reasonable expectation that thereby will be preserved or acquired a wholesome condition of body, and, as a resultant, a healthful condition of mind.

It is not intended that these exercises shall enable one to run like the antelope, jump like the roe buck, or carry a heavy load like a beast of burden. Health, rather than great strength or exaggerated muscle, is the need of modern life. A symmetrically developed body, imparting ease of muscle and of motion that will enable one to pursue in comfort the ordinary occupations that pertain to civilized industries, is the essential want, and given health and a reasonable amount of muscular cultivation that will result from simple calisthenic exercises, one may expect the easy acquirement of the special muscular strength required for a particular occupation, when that occupation has been entered upon as a life vocation. This acquirement will come naturally through use, and man must needs mold himself according to the strain that his business imposes upon him. It is, therefore, a wasteful expenditure of vitality and force to develop muscles necessary for a blacksmith, a porter, or an acrobat, that will not be needed in a calling that requires development on entirely different lines.

An illustration of this principle is found in the

custom, common in armies, of training the soldier in time of peace so that he will be in a hardened physical condition when required to take the field for active war service. To this end the soldier is, at certain periods, practiced in daily marches with knapsack on his back, and with other accoutrements of considerable weight, the object being to develop his marching muscles and the muscles that carry his equipment. There is no gymnastic training that can take the place of these practice marches, and though the soldier might be given a training that would fit him for a contest in ball games, or as an acrobatic performer or a fistic gladiator, yet there is a great chance that, in acquiring skill for these performances, he would be unfitted for the requirements of hard service.

In one of our cities at the commencement of the Civil War, there was raised a regiment of volunteers composed largely of men skilled in gymnastic exercises. Wonderful service was expected of the men of that regiment. They were to leap over rivers, fire on the enemy from high tree tops, execute long flank movements on the run, and show their agile and muscular accomplishments in various and astonishing ways. But soon after taking the field the men developed all sorts of weakness due to overtraining. They could not stand exposure, marching knocked them up, and the regiment fell to pieces.

A communication to the Army and Navy Journal from Captain George Van Horn Mosely, Fifth Cavalry, on the subject of athletics and athletes in the

army, says: "These highly-trained athletes are not always the men who best withstand the strain of hard field service; quite the contrary; these men are often the first to fall victims of disease."

In this connection may be quoted from a work, "Diseases of Modern Life," by Dr. Benjamin Ward Richardson, a world-wide authority on the health and vitality of man, and the favorable or unfavorable habitudes that affect him:

"There is hardly a more difficult problem of our time than that of determining the natural bounds of physical labor. There is no sign, there is no evidence anywhere, that the extreme culture of physical strength has favored the longevity of an individual or the vital tenacity of a race. The observations made by the physicians of the Greek, Roman, Arabian and Italian schools respecting *excessive* physical exercise and the maladies incident to it, admit of but one rigid interpretation, viz.: that such exercise insures premature decay and early death, and the facts to be elicited in modern times from the vital statistics of England, France and Prussia, lead equally to the inevitable conclusion that *excessive* physical exertion is unnecessary for sustaining vital power or mental endowment.

"By skillful training men are brought to a fine external standard, but the external development is so commonly the covering of an internal and fatal evil, that I venture to affirm there is not in England a trained professional athlete of the age of thirty-five,

who has been ten years at his calling, who is not disabled. In my professional work I have been in attendance on as many as seven men thus brought to incapacity."

There is no doubt that the *tendency* of most athletic exercises is toward over-doing, and the warning conveyed in what Richardson says should impress on us the Latin injunction, "*ne quid nimis*"—excess in nothing, moderation in all things.

WHEN IS THE BEST TIME FOR EXERCISE?

Authorities do not seem agreed as to the proper time for taking exercise, especially as to the time before or after meals. One authority says: "Not immediately before a full meal, nor within one or two hours after it," but this injunction was probably intended to apply to a very hearty eater, and to severe exertion. There is an old English saying:

"Before breakfast, walk a mile;
After dinner, rest awhile;
After supper, with pipe,
A careless hour beguile."

Emphatic objection may be made against an outdoor walk before breakfast. In my army life I have known zealous Post Commanders who, at certain seasons, had their commands at drill before breakfast, and the result always was a considerable increase in the sick report; and this is an old experience. Shakespeare, a wise authority in many things, makes the wife of Brutus say: "Is Brutus sick, and is it well to walk unbraced, and suck up the humors of the damp morning and unpurged air, to add unto his sickness?"

There is a German saying:

"After dinner, stand awhile,
Or take a walk of half a mile."

This saying is in accord with and very similar to what Shakespeare makes another of his characters say: "But for your health and your digestion sake, an after-dinner turn."

The German and the Shakespeare suggestions indicate better practice as to *a little* exercise after dinner than the English admonition to "rest awhile." Inclination is doubtless in favor of the latter, but "inclination" should not make rules of conduct, and so, if after dinner it is not convenient to walk the half-mile, we had better stand "awhile" (say about fifteen minutes), and, in fact, we would probably benefit by taking a *little* exercise after every meal, and not flop down into the first easy chair that may be convenient.

A wise man being asked what was the proper time for supper, made answer: "If you are a rich man, whenever you please; and if you are a poor man, whenever you can." And as hardly anyone thinks he is rich in time, and all are alike poor in that commodity, it may be said that the proper time for exercise is *when you can,* always observing moderation.

PHYSICAL EXERCISE.

"Physical exercise may be defined as muscular movement produced by *muscular contraction.* It should be regulated by individual fitness, should be *approached gradually,* and increased only with increasing strength." McLaren.

CALISTHENICS.

Calisthenics has been defined as "The art or practice of exercising the muscles for the purpose of gaining or retaining health, strength, and grace of form and movement."

MASSAGE.

The Century Dictionary has the following definition of massage:

"The act or art of applying intermittent *pressure* and *strain* to the muscles and other accessible tissues of the body. The means employed are rubbing, kneading and light pounding, combined ordinarily with more or less stimulation of the skin, as by slapping and friction. This manipulation furthers the removal of lymph from the parts, which is especially needful when the lymphatic flow is sluggish *through lack of muscular exercise.* It quickens the blood circulation through the part, and furnishes gentle vasomotor exercise. It acts possibly as a direct trophic stimulant to muscular and sustaining tissues. By *stretching* ligamentous structures, it maintains and increases suppleness. In the abdomen it stimulates and aids peristalsis, and as a general stimulant of sensory nerves it may affect favorably the nutrition of the central nervous system. It is represented in the customs of many primeval peoples, and in a developed form constitutes a valuable resource of modern scientific therapeutics."

Another authority says: "Massage has long been known for its efficacy in the loosing of stiff joints, the cure or alleviation of rheumatism, neuralgia, bruises and sprains, and the movements, properly used, affect both the superficial and the deep tissues, and pain is thereby soothed by a lessening of the acute sensibility of the nerves. The circulation of the blood is accelerated, and in consequence there is a removal of morbid products and an increased nutrition of tissues."

It would be well to carefully fix these definitions in the mind, so that when practicing the movements contained in this Primer it will be a satisfaction to feel an assurance of the beneficial results that may be expected to follow.

Usually, massage treatment consists in producing an increased circulation of the blood by hand pressure on the muscles by an operator called a masseur, but this muscle pressure and blood circulation may be effected as well, and perhaps better, by the individual himself without having recourse to the masseur, through the practice of movements of the body and pressures that will exercise the articulations, and that will cause the muscles to contract and thereby press upon and squeeze their arteries and veins. By this method, time and expense may be saved, and the sometimes disagreeable association of a masseur be avoided.

For the purpose, therefore, of aiding and encouraging one to be his own efficient masseur, the follow-

ing simple and easy exercises are recommended for a daily practice of ten or twenty minutes, or possibly for a longer time, or frequently during the day, when topical treatment may be needed for a local pain or infirmity. There are, however, some persons, especially those who may suspect that they have any heart weakness, who should consult a physician as to the propriety or safety of their using exercises of this nature.

It is important that the movements be slow and deliberate, not jerky nor precipitantly wrenching, and that each movement be made to the full extensor or flexor capacity of the muscles involved.

The exercises should be made standing in the centre of a well-ventilated room. The dress should be scant, light and loose, having regard to the temperature of the room. Performance of the described exercises do not involve difficult feats or severe strains, and the performer should always have in mind that the object sought is to accelerate the flow of blood, to supple the articulations and muscles, and to assist the various organs in their normal functions.

When commencing the exercises, the time should be noted as shown by the clock or watch, in order that the performer may not cheat himself into thinking that he has exercised ten or twenty minutes, when half that time has not elapsed. Each stretched or taut position that is taken should be kept while one counts five, the count being at the rate of about one (1) to the second. It is very important that careful *count-*

ing should be observed, for it not only determines the measure of the particular exercise, but occupies the mind and helps to make the time spent in the motions be less irksome and pass more rapidly. Calisthenics without counting is insufferably tedious and tiresome, and inclines one to abandon the exercise.

A limb or any part of the body can be *moved further,* with least danger of sprain, toward a given point or in a direction by a slow, *stretching or reaching motion,* than can be accomplished by a rapid thrust or quick motion toward the point or direction, and the slow, stretching, or reaching motions that are directed in many of the exercises will produce a greater and longer continued *compression* on the muscles, arteries and veins, and consequently better results attained, than can be arrived at by a quick succession of alternating extensor and flexor motions, such as are usually practiced in calisthenic exercises, and they are designed, when practiced seriatim, to act on muscles and articulations of the body from the crown of the head to the soles of the feet.

It is not within the scope of this manual to include all the possible movements of the body, and as the performer may wish to add other motions that he may fancy as desirable, a few blank leaves are inserted for noting them.

IN PERFORMING A MOVEMENT ONE OR BOTH HANDS SHOULD BE USED IN PRESSING AND KNEADING THE JOINTS AND MUSCLES CONCERNED IN THE MOVEMENT. THE

HANDS SHOULD ALSO BE USED, WHEN PRACTICABLE, IN MODERATELY OPPOSING THE MOVEMENTS. The habitual practice of this, calling forth greater muscular action and effort, will largely increase the beneficial effect of the exercise.

This hand pressure against a movement is specified in some of the following exercises, and can be employed in many of the motions of the arms, legs and hips. The intelligence of the performer will suggest the occasions and the proper manual.

It is evident that pressure and kneading and opposition of the hands to movement will enable one to obtain in a short time better results than could be arrived at during a much longer period devoted to simple extensor and flexor motions.

AFTER THE PERFORMANCE OF A STRETCHING MOTION, IT SHOULD, WHEN PRACTICABLE, BE REPEATED SEVERAL TIMES IN ALTERNATE EXTENSOR AND FLEXOR MOTIONS, OPPOSING WITH THE HANDS.

POSITION.

The habitual position of the body, preliminary to a performance, should be—body resting equally on both feet, which should be 8 or 10 inches apart; shoulders equal, arms hanging naturally by the side, head thrown back, chin slightly raised, eyes to the

front. When a movement has been finished, "position" should be resumed.

EXERCISE FOR THE HEAD.

Place the flat of both hands, fingers extended, on the head, pressing gently, move the skin back and forth on the subjacent bones. All the head should be gone over, changing the position of the hands when 5 movements have been made by them. After the head has thus been gone over, place the flat of both hands on the face, and, pressing gently, move them slowly upward over the forehead, the top of the head, down to the neck, and around under the jaws. Do this 5 times.

Do not press too hard, especially when working with the tips of the fingers about the eyes and nose. Finish by gently opening wide the mouth and then closing it. Repeat this 5 times. (This exercises the muscles and bones connected with the ears, and may be beneficial for the preservation of the hearing, and will sometimes relieve a pain or singing in the ear.)

The head exercise should continue about 3 minutes. It may often prove useful in alleviating a headache, for the preservation or growth of the hair, and for the prevention or removal of wrinkles in the face.

EXERCISE FOR THE HEAD AND NECK.

Keep each position till 5 has been counted. The head should be brought forward to the front after

completing the count, and before beginning another position. The motions are to be performed gently, without jerk or undue strain.

Turn the head, gently, square to the right.

Turn the head square to the left.

Turn the head backward, so as to look directly above at the ceiling.

Turn the head toward the upper right-hand corner of the room.

Turn the head toward the upper left-hand corner of the room.

Turn the head toward the upper right and rear corner of the room.

Turn the head toward the upper left and rear corner of the room.

Look at the top of right shoulder.

Look at the top of left shoulder.

Look at the rear of right heel.

Look at the rear of left heel.

While the counts are being made, the neck may be rubbed with the hands, gathering the skin in folds between the fingers and thumbs and ball of the hand.

Place the palm of the right hand against the right side of the head, just above the ear, and bend the head slowly to the right as far as possible, resisting the movement with the hand; the movement being accomplished, press with the hand so as to bend the head back to its former position, resisting the movement with the head 5 times.

Make similar movements of the head with the left hand against the left side of the head, 5 times.

Place the palms of both hands against the forehead and bend the head to the front, resisting the movement with the hands; the movement being completed, press with both hands and move the head back to its position, resisting the movement with the head, 5 times. Make similar movements of the head, with both hands pressing on the back of the head, 5 times.

When first practicing the four preceding movements, the pressure or resistance should not be strong, but gentle, as it is an unusual exercise for the neck; it is not accustomed to be impeded in its movements. The resistance may be increased as the muscles become used to it and gain in strength.

(The neck exercise, with rubbing, are effective in reducing the size of the neck when too enlarged by adipose tissue.)

EXERCISE FOR THE ARMS AND SHOULDERS.

Keep each attained position till 5 *has been counted.* Raise slowly the right shoulder up toward the ear as far as possible, at the same time pressing on it with the left hand. Having counted 5, move the shoulder up and down 5 times, continuing the hand pressure on it. In like manner raise the left shoulder, using the right hand for pressure on it. Then raise both shoulders together 5 times.

Stretch out slowly the right arm horizontally to

the right, reaching out as far as possible, letting the collar bone and shoulder blade share in the movement; then toward the upper right-hand corner of the room; then to upper left-hand corner; then to the ceiling directly above the head; then square to the left horizontally.

Stretch out slowly the left arm horizontally to the left, reaching out as far as possible, letting the collar bone and shoulder blade share in the movement; then toward the upper left-hand corner of the room; then to the upper right-hand corner; then to the ceiling directly above the head; then square to the right horizontally.

Carry the right arm in front and to the left of the body, and reach as far as possible around the waist.

Carry the right arm in front of the body, under the left arm, and reach as far as possible around the body.

Carry the right arm in rear of the body, and reach as far as possible around the waist.

Carry the right arm in rear of body and reach as far as possible upward and toward the left shoulder blade.

Carry the right arm in front of the body and reach as far as possible over the left shoulder and down the back.

In manner as in the five preceding directions, carry the left arm toward the right side of the body, front and rear, reaching as far as possible.

Reach with the right hand as far as possible over the right shoulder, and at the same time reach with the

left hand over the left shoulder, both elbows to the front.

In the preceding *reaches,* while 5 is being counted, the hands should be employed in pressure and rubbing on the parts where they may be, and against the subjacent bones.

Place the right hand on the right shoulder and the left hand on the left shoulder, elbows to the front, then carry back the elbows to the rear as far as they will go, elbows at the height of the shoulder.

Stretch out both arms to the front, palms up, fingers extended; then revolve inward the hands and the arms until the thumbs point down and outward.

Stretch both arms to the rear as far as possible, hands well raised, backs outward; make the same movement of the hands, backs inward.

Stretch out both arms sidewise and horizontally; then revolve the arms on the shoulder joints, describing a small circle with the hands, 5 times to the front and 5 times to the rear.

Stretch out both arms as far as possible directly above the head.

Place the right hand on the right shoulder and the left hand on the left shoulder, elbows raised and well back; then fling out the arms sideways, fingers extended, 5 times.

Standing with the feet about eight inches apart, swing both arms to the front and rear, 5 times; at each swing to the rear rise a little on the toes, letting

the upper part of the body conform to the movements, so as to preserve the balance.

During the arm exercises, the eyes should usually follow the direction of the movements, turning the head for that purpose; and during the counts, the fingers, when not otherwise used, may be vigorously exercised by spreading them apart; by closing hard the hand, the fingers bent; by closing the hand, the fingers straight, and pressing them hard against the ball of the hand.

When one has learned the routine movements for the right and left arms, it would be best to change the order of practice, so that when a prescribed motion has been made by the right arm, there shall then follow the corresponding motion prescribed for the left arm. This alternating movement of the arms will prevent one from becoming tired through a too close succession of movements, involving the same or adjoining muscles, and will also equilibrate the circulation in the right and left sides of the body.

A further exercise for the arms and shoulders, in extensor and flexor movements, is to clasp the hands together and move the arms in various directions, from and to the body, and around it, using the force of one arm to make a direction, and using the force of the other arm to resist the motion. After a few motions have been made in a direction, the clasp of the hands should be reversed, so that the arm which has been used for motion in a direction shall be used to resist the motion in that direction. This exercise

should be gentle at first, and can ultimately be made to involve considerable muscular exertion, followed by desirable gain in muscular strength.

EXERCISE FOR THE HANDS, WRISTS AND FINGERS (COUNT 5).

The thumbs being up, bend each hand at the wrist as far as possible toward the foreside of the arm; then bend each hand as far as possible toward the back of the arm.

The backs of the hands being up, revolve the hands on the wrist joints as far as possible outward, that is, toward the little finger; then revolve the hands as far as possible inward, that is, toward the thumbs. One hand only may be revolved, using the other hand to press the muscles and ligaments concerned in the torsion movement. This exercise is useful for alleviation or cure of habitually cold hands.

A further good exercise for the fingers is to place the palm of the hand on a flat surface, say a table, and then give the thumbs and each finger lateral motions to full extent. This exercise tends to subjecting the separate fingers to the control of the will.

The hand and finger exercise will be found to be beneficial in rheumatism of the fingers, and in such a case should be frequently practiced during the day; but when rheumatism has enlarged the joints there should, in addition, be practiced a hand massage on them, more or less vigorous, depending on their condi-

tion of sensitiveness, in order to break down the morbid accretions. Patience and time, it may be months, will often bring relief and perhaps cure, unless there is ankylosis, which makes a case for the advice of a surgeon.

EXERCISE FOR THE ABDOMEN, THE HIPS, AND THE SMALL OF THE BACK.

Keep each position till 5 has been counted. Bend the body slowly forward on the hip joints, till the tips of the fingers can be rested on the floor, or as near thereto as can be done *without severe strain,* bending the knees naturally as may be required for easy performance of the movement.

Carry the right foot to the front about twelve inches, and a little to the right; then bend the body on the hips diagonally to the front and right over the right knee and right foot, till the fingers can be rested on the floor, bending the knees sufficiently for easy performance of the movement.

Carry the left foot to the front about twelve inches, and a little to the left; then bend the body on the hips diagonally to the front and left, over the left knee and left foot, till the tips of the fingers can be rested on the floor, bending the knees sufficiently for easy performance of the movement.

Bend the body on the hips as far as possible to the right.

Bend the body on the hips as far as possible to the left.

Bend the body on the hips backward till the eyes strike the ceiling directly above.

Bend the right hip to the right as far as possible, the weight of the body resting principally on the right leg, the toes of the left foot resting lightly on the floor, the heel a little raised.

Bend the left hip to the left as far as possible, the weight of the body resting principally on the left leg, the toes of the right foot resting lightly on the floor, the heel a little raised. (In the two preceding movements the feet should be about twelve inches apart.)

Walk slowly across the room, taking steps of about twenty-eight inches, halting at each step, and projecting the upper part of the body and abdomen well over the advanced foot, resting the principal weight of the body on the advanced leg, the foot in rear resting lightly on the toes, the heel raised. Retain this position till 5 has been counted, and so seriatim with the legs till five steps have been made.

Walk slowly backward five steps, taking steps of about twelve or fifteen inches, halting at each step, inclining the upper part of the body to the rear, eyes looking up toward the ceiling, weight of the body resting principally on the rear leg. Retain the position at each step till 5 has been counted.

Raise up the right knee as far as possible, knee vertically over the instep. Raise up the left knee in like manner.

TO ROTATE THE UPPER PART OF THE BODY ON THE HIPS.

Place the hands on the hips, thumbs to the front, elbows well back, the feet twelve or fifteen inches apart, and revolve the upper part of the body on the hips, first to the right five times, and then to the left five times. To make the movement, the head should make as large a circle as possible around the position of the body, *always keeping the face toward the front.* It should be done slowly, in order that it may be done completely and without strain or sprain.

Practice the reverse of the preceding movement by slowly revolving the hips on the upper part of the body, five times to the right and five times to the left.

The strong compression on the abdomen produced by the preceding exercises has a special influence in increasing the circulation of the blood in the organs situated in the abdominal cavity (the liver, the kidneys, the spleen and others), and these exercises may often be beneficial in relieving them when in a sluggish or otherwise morbid condition.

EXERCISE FOR THE LEGS.

In order to steady one during the leg exercises, recourse may be had, when desired, to resting the hand lightly on the back of a chair or other convenient article of furniture.

Keep each position till 5 has been counted.

Raise the right leg straight out to the front and as high as possible.

Raise the left leg in like manner.

1. Carry the right foot to the front about fifteen inches, and rest the heel on the floor, the toe pointing well upward.

2. Carry the left foot to the front in like manner.

3. Carry the right foot to the front about fifteen inches, and rest the ball of the foot on the floor, heel well raised.

4. Carry the left foot to the front in like manner.

5. Carry the right foot to the right about fifteen inches, and rest it on the side at the big toe, heel well raised.

6. Carry the left foot to the left about fifteen inches, and rest it on the side at the big toe, heel well raised.

7. Carry the right foot to the left, and over the left foot about fifteen inches, and rest the side of the right foot at the little toe on the floor, heel well raised.

8. In like manner carry the left foot over the right about fifteen inches, and rest it on the side at the little toe.

9. Carry the right foot to the rear about twenty-five inches, and rest the point of the toes on the floor, the sole vertical; when 5 has been counted, let the foot revolve backward on the toes until it rests flat on the floor and square to the left foot, the knees

well bent; weight of body equally on both legs. Rest in this position till 5 has again been counted.

10. Carry the left foot to the rear and perform in like manner.

Swing the right leg gently to the front and rear 5 times, describing only a small arc, so as not to strain. The joints of the hip, the knee, and the ankle should be made to join in the movement.

Swing the left leg gently to the front and rear in like manner.

Carry the right foot to the front about fifteen inches and pedal it, that is, rest it alternately on the heel and toe, five times.

Carry the left foot to the front about fifteen inches and exercise it in like manner.

A movement very similar to the preceding is to stand with the heels four or six inches apart; then raise the heels so as to throw the weight of the body on the toes; then lower the heels and raise the toes so as to throw the weight of the body on the heels; and so alternating the motions, letting the body conform to the movements so as to preserve balance, 5 times.

Carry the right foot to the front about fifteen inches and about twelve inches from the floor, and describe with the toe a small circle of about eight or ten inches, revolving the foot on the ankle joint. Make the movement 5 times to the right, then 5 times to the left. This should be done slowly, in order to make a complete rotation of the ankle joint and to avoid straining it by a too rapid motion.

Make the same movement as in the preceding, with the left foot.

Raise the right foot a little from the floor, bending the knee, and kick out gently to the front about twelve inches, keeping the toe depressed; do this 5 times, then raise the toe, the heel depressed, and kick out with the heel, 5 times.

Make the same movements with the left foot.

In each movement of the leg or foot, use one or both hands to press on the muscles and ligaments involved in the motions. The *torsion* movements and pressures are especially useful for alleviation or cure of habitually cold feet. Perhaps a more effective practice for this purpose is to sit in a chair and use the pedal exercises and the torsion motions, pressing with *both hands* on the muscles from the knee down.

Very similar to the pedal exercise of the feet, is a movement which can be recommended when riding in a vehicle in cold weather. This consists in forcing the feet, without raising them to disturb the lap cover, alternately against the foot-board or against any resisting object in front. The motion pumps the blood through the veins of the legs and soon brings warmth to the feet.

Many years ago I made a two-days' stage trip in mid-winter, in Wyoming. The weather was intensely cold, and I had a seat outside with the driver. In the course of the journey I inquired of him if he had ever had recourse to this method of keeping his feet warm. He said he had never heard of it, but

that his experience ought to have taught it to him, for he had often noticed when his feet were cold just before descending a long hill (and there were many on the route), that by the time he arrived at the bottom of the hill they were perfectly warm. He had not thought of the reason, but now it seemed evident, for in going down hill he had one foot on the brake and the other on the foot-board, and the irregular lurching motion of the stage made it necessary for him to balance himself by throwing his weight first on one foot and then on the other, bringing great pressure on the muscles of the feet and legs, and pumping warm blood into them.

THE WAND AND DUMB-BELLS.

Convenient appurtenances for a more severe exercise of the arms, and incidentally of the upper portion of the body, are the wand and a pair of dumb-bells, the latter not to exceed two pounds in weight. The wand may be a smooth, round piece of wood, say about three-quarters of an inch in diameter, and in length a little less than one's height. It can be used as a lance or spear for making easy thrusts in various directions, or, holding it lightly in both hands near the ends it can be moved over and around the body in many ways. The exercise is good for the muscles of the back, and for suppleing the joints of the arms and the elastic ligaments of the backbone. A proper

wand can be procured from an upholsterer or picture dealer.

The dumb-bells can be used for motions in the many ways prescribed for stretching out the arms (without counting), and by moving them around and over the surface of the body in many directions. The handles should have a covering of thin, clean paper crimped on them, to protect the hands from their cold.

IMAGINARY DUMB-BELLS OR WEIGHTS.

One can have excellent and moderately severe exercise with what may be called "imaginary" dumb-bells or weights, which consists in imagining that he has dumb-bells of rather heavy weight in his hands, and then moving them slowly around in many directions, raising them slowly from the floor and letting them down again, always keeping the muscles tense during the effort at the imaginary weights.

Or one can reach out the arms as far as possible in different directions and draw them back slowly to the body, imagining that the hands have hold of the end of a rope passing over a pulley, the other end of the rope having a heavy weight attached which requires considerable effort to raise. When the hands have arrived at the body, the imaginary weight then being raised, the weight should be allowed to slowly lower until the arms have reached a full stretch position. Do this 5 times. The muscles should be kept tense during the efforts.

EXERCISE IN A CHAIR.

When a person has become familiar with these exercises, it will be perceived that some of them can be practiced while sitting in a chair. For this purpose a low-backed rocking chair is best, as it readily yields and accommodates itself to the motions of the body.

The exercises that may be done in a chair are especially massage of the head; head and neck exercise; most of the arm exercises; some of the exercises for the abdomen; some of the exercises for the legs, feet, and ankle joints; the exercise for the wrist joints, hands and fingers, and the breathing exercise.

In this connection may be recommended the use of a rocking chair for exercise by a ninvalid. It's use may be moderate or vigorous according to the will or strength of the patient. It brings into play many muscles of the body.

EXERCISE FOR THE TOES.

Being seated in a chair, shoes and stockings removed, place the feet flat on the floor and quite near the chair, then raise the heels as high as can be done, keeping the toes flat on the floor, and bending the feet at their base; then return the heels to the floor. Do this 5 times.

Second: Raise the heels as high as can be done, the toes stiff, revolving the feet on the points of the toes

and resting the weight of the feet on the points; then return the heels to the floor. Do this 5 times.

Place the feet on the floor, resting their weight on the heels, toes slightly raised; then work the toes up and down, bending them and the arch of the foot as much as possible. Do this 5 times.

Place the feet flat on the floor, and move the big toes back and forth laterally as far as possible from the adjoining toe.

The toe exercise, combined with hand rubbing, will tend to restore a healthful veinous condition to the feet, relieve them from congestion, strengthen and supple them, and contribute toward their serviceableness for walking.

No part of the body is so much mistreated as the feet. Too frequently the shoe does not fit properly, and its undue pressure on some part of the foot interferes with the circulation of the blood, resulting in corns, callouses, or other impairments. Also the shape of a shoe does not conform to the natural shape of the foot, and usually bends the big toe out of its normal position and forces it against the adjoining toe. The big toe of a child, before it has been distorted by a shoe, is straight; its outer side, except a slight curve from the first joint and along the nail, is on a straight line tangent to the side of the heel and the side of the ball of the foot. The toe exercise and the wearing of shoes straight along the inner line, would help the big toe toward resuming its natural

position, and allow it to perform the full work intended for it.

There is a serious fault in shoes that is almost universal. This is the curve given the fore part of the sole, which shoemakers call the "spring," the sole being turned up in front like a sled runner.

If one will take off the shoe and stocking and place the foot on the floor, it will be seen that all the toes are stretched out flat, grasping the floor as it were, at their full length, their bottoms on the same plane with the bottom of the heel. But when the shoe is worn, its up-curved sole prevents the toes flattening out, resists their natural action to do so, bringing a constant resisting pressure on them, annoying and tiring them.

Man is a plantigrade animal, that is, *fashioned to walk flat-footed,* but Nature is thwarted, so that when he walks in his curve-soled shoes his toes perform an undue amount of labor in their unavailing effort to flatten out, and instead of being allowed to have a full bending motion at theeir base joints, as is natural, there is substituted a rolling or rocking motion on the ball of the foot. Nature is outraged, the foot is injured, and its capacity for easy work greatly abridged.

It is not only in walking that the "spring" is objectionable, for even when sitting in a chair with the feet on the floor, the toes are making an effort to flatten out, to be on the same horizontal plane with the bottom of the heel. But this is effectively resisted, and so the toes and connecting parts of the

foot are kept at work without relaxation; the foot is worried and wearied, and the entire nervous system suffers, and usually without the cause being suspected.

The remedy for the evils caused by the "spring" would be the use of a shoe, the fore part *flat soled.*

EXERCISE WITH A CANE.

The cane is held in the right hand, by the side, the principal pressure on it being between the base of the thumb and first finger, and, to a less degree, the second finger; the third and fourth fingers clasping it lightly or relaxed; the cane sloping downward toward the front, the point about six inches from the ground; the feet about fifteen inches apart.

THE MOTIONS.

Movements should be accurately and fully completed; their practice gives strength and suppleness to the wrist, forearm and shoulder, which are principally concerned in making the manipulations. Movements should be gentle and slow, especially at commencement and until accustomed, in order to avoid too much strain and consequent sprain.

It would be advisable preceding, or preliminary to, the cane exercise to practice a wrist and forearm exercise, without anything in the hands. Such exercise will supple and strengthen the wrist, and the cane

can be more readily handled and with less risk of sprain.

NO. 1—WRIST EXERCISE (Without Cane.)

Raise the arms horizontally to the front, back of the hands up, palms open, and by a turn of the wrists and a slight action of the forearms, describe with the hands a full circle outward of about eighteen inches, 5 times; then circle inward 5 times. Continue this exercise, with short intermissions, until the muscles concerned are a little tired.

NO. 2—CANE OVER HEAD.

Hold the cane with both hands near the ends, and raise it over head to full extent of the arms ten times, at each raising bringing the hands a little nearer each other, so that at the tenth raising they will be touching each other at the center of the cane; then practice the reverse of this by holding the cane with both hands touching at the middle, and at each raising separate the hands a little, so that at the tenth raising they will be holding the cane near the ends. (The wand can also be used in this motion.)

NO. 3—HALF CIRCLES TO THE FRONT.

Holding the cane at the middle, the hand to the front at the height of the shoulder, by a turn of the

wrist and forearm rotate it in front of the body a half-circle to the right, then back, a half-circle to the left, continuing the rotations ten times; then with the cane in the left hand, rotate it in like manner. These rotations make a great torsion strain on the arm; the action, therefore, must not be extreme or swift. With the other hand press the muscles involved in the torsion movement. (The wand can also be used for this motion.)

NO. 4—STRIKE TO THE FRONT.

Raise the point of the cane through an arc of about twenty-four inches and strike down smartly to its former position, using the wrist and fore-arm, 5 times. Raise the cane similarly and strike down to its former position, forming a small half-circle to the right, 5 times. In like manner strike down, forming a half-circle, to the left, 5 times. Raise the cane through an arc of about three feet, and strike briskly to the right, 5 times, using wrist and fore-arm; then strike to the left, 5 times; then execute all these strikes 5 times with the cane in the left hand, substituting left for right.

NO. 5—STRIKE TOWARD THE SHOULDERS.

Raise the point of the cane briskly upward, striking toward and nearly reaching the right shoulder, using the wrist as a pivot, 5 times; in like manner

toward and near left shoulder, 5 times, then toward the right and left shoulders, alternately, 5 times. Make similar strikes toward the shoulders with the cane in the left hand.

NO. 6—CIRCLING BY THE SIDES.

Raise the hand to height of and near the right shoulder, cane vertical, point up, and strike smartly forward near the ground, full circling by the right side, using wrist and fore-arm, 5 times. Raise the hand similarly to the left shoulder and strike smartly forward near the ground, full circling by the left side, 5 times.

Having well practiced the forward circling strikes, reverse the motions and strike backward, starting the circling toward the rear. With the cane in the left hand, make the same circling strikes, substituting left for right. When conversant with these strikes, make variations on them by striking alternately along the right side and then along the left side, 5 times.

In order to protect the left hand and arm when circling with the right arm along the left side, carry them well to the rear, against the small of the back. The right hand and arm should be protected in like manner when circling with the left arm along the right side.

NO. 7—CIRCLING TO THE FRONT.

Raise the cane horizontally to the front to the height of the right shoulder, point to the front, arm ex-

tended free from body, elbow a little bent; then with a motion of the wrist and fore-arm describe with the point a circle to the right of about twenty-four inches in diameter, 5 times; then a circle to the left, 5 times; then with the cane in the left hand make the same motions and circlings opposite the left shoulder, 5 times to the left and 5 times to the right.

NO. 8—CIRCLING TO THE LEFT AND RIGHT.

Raise the cane horizontally to the front to the height of the right shoulder, point to front, arm extended, free from body, back of hand up; carry the left hand to the small of the back, then drop the point of the cane to the left with a turn of the wrist and fore-arm, and describe a full circle, the cane passing near the left shoulder, relaxing the pressure of the second, third and fourth fingers to allow the wrist to pivot readily, 5 times. In like manner the cane is circled to the right, the point dropped to the right, the cane passing near the right shoulder, 5 times.

After being well practiced in the circlings, they should be practiced alternately—a circle to the left, then a circle to the right. With the cane in the left hand, make the same movements and circlings.

NO. 9—CIRCLING TO THE REAR.

Bring the cane to a vertical position, back of the hand to the front, at the height of and near the right

shoulder; then carry the hand close to and behind the right ear and make a circle to the left, by a turn of the wrist, keeping the cane as close to the back as possible, 5 times. With the cane in the left hand, make the same movements and carry the left hand close to and behind the left ear, and make a circle to the right by a turn of the wrist, keeping the cane as close to the back as possible, 5 times.

It would help one to acquire facility in No. 9, if he were to practice the movements without the cane, thus suppling the arms and shoulders. Some of the numbers can be practiced anywhere, even on crowded streets; others can be practiced on country walks, or where there is no crowd.

There is more exercise in a gentle cane-play while walking than would at first seem; for not only are the arms and shoulders exercised, but there is an increased motion given to the abdominal muscles, to those at the sides of the waist, and in fact to all the axial muscles. Every swing or change of position of the cane makes a change in the center of gravity of the body additional to what takes place in ordinary walking, compelling greater accommodating movements (perhaps involuntary) in the upper part of the body, in order to maintain a comfortable balance.

The cane exercise gives suppleness to the upper part of the body, and affords much of the benefit derived from practice with the Indian clubs, and has the advantage that it can be practiced in the open

air, while walking to and from one's place of business, and does not infringe on one's time.

The amount of exercise for the arms and shoulders thus obtained in a mile walk, at a moderate pace, is at least equivalent to what would be derived from a twenty-minute exercise indoors with a moderate-weight Indian club.

When one has become accustomed to and skilled in the movements, it will be desirable, when outdoors, that they be continued with one arm through a distance of 200 or 300 yards, before changing the cane to the other hand.

RESPIRATION.

As exercise has great influence on, and is intimately connected with, respiratory movements, it is well to say something on the subject of respiration.

The act of respiration includes inspiration and expiration, and may be defined as the aggregate of those processes which are concerned in the introduction of oxygen into the system, and the elimination of carbon dioxide from it, thus purifying the blood and fitting it for the nourishment of the body. Under normal and healthy conditions, inspiration and expiration are involuntary, but nevertheless the will can control their action, and, for a limited time, increase or suspend it; and it may sometimes happen that the will power should be used to quicken or make more complete the respiratory process, and thus

may be brought into practice what in popular language is termed "deep breathing."

DEEP BREATHING.

To accomplish this, close the mouth firmly, carry the head a little back, *the chin well raised,* the belly drawn in. Then make *successive* motions of pressing the upper part of the body down on the hips, continuing the motion till there is a feeling that the lungs are filled with air and expiration begins through the nostrils. There need not be any attempt to force the inhalation during the pressing down process, for it is accomplished without effort or will on the part of the performer by a natural or mechanical flow of fresh air through the nostrils into the lungs, filling them to their receptivity. For a more complete renewal of fresh air in the lungs, go through the process several times in succession, a little delay between each time. The efforts give exercise to the muscles of the chest, the abdomen and the muscular attachments of the diaphragm from the vertebrae forward.

Instead of pressing *down* on the hips, successive efforts may be made as if to raise the upper part of the body *off* the hips. The two methods may be advantageously used alternately.

It is to be understood that deep breathing is a practice that should be used guardedly or in moderation, and not to an extent that might strain the lungs and

impair the elasticity of their air cells. This danger is frequently incurred by professional athletes, and broken health is the inevitable result.

Deep breathing is noticed principally for information how it may be accomplished, in order that it may be used when necessity or comfort would indicate it, in case of difficult or suppressed inspiration occasioned by asthma or inflammation of the air passages, when resort to it may often bring relief. As a general reason against its too frequent use, it may be said that it is contrary to Nature's law that the lungs or any other vital organ should be forcibly exercised and developed to an extent greater than normal or usual demand may require; for the undue use or development of a part of the body works injury to that part and to the parts intimate with it.

A moderate and convenient action for inducing deep breathing is to bend forward the upper part of the body on the hips to an angle of about forty-five degrees, raising the chin, head thrown back, chest thrown forward. The motions involved expand the chest and influence a corresponding expansion of all the breathing machinery, and fresh air flows in to occupy the space thus enlarged. When there is much obstruction in breathing, successive sniffs or inspirations should be resorted to while the body retains the position prescribed. A person sitting up in bed or in a chair can easily use this method, and it should be frequently used by a person whose chest is habitually cramped by work at a desk or over a bench.

Man is supposed to spend about eight hours out of the twenty-four in bed; he is in a recumbent position one-third his life-time. It is, therefore, important that his position when lying down should be such that his respiration may not be hampered. For this reason his pillow should be of a width sufficient to support the head, the full length of the neck, and the upper part of the shoulders, thus allowing the chin to be raised and not permitting it to be depressed, and thus constricting the air passages, as is the case when only the head rests on the pillow.

MOUTH BREATHING.

"And the Lord God formed man out of the dust of the ground, and breathed into his nostrils the breath of life, and man became a living soul."—Genesis.

The Creator animated man by giving him life through his nose, and not through his mouth, and experience teaches that the healthful condition of the breathing machinery requires that the nose alone should be used for breathing. The mouth was not made for an air passage, it was intended for taking in food, for mastication, deglutition, and the utterance of the voice, and it should be borne in mind that each part of the body was created for a special use, and when put to a use different from its intention, evil results follow the violation of nature's

adjustment, and nothing is more certain than the evil results that follow the use of the mouth as an air passage either in inhalation or in exhalation.

When inhaled air passes through the nose toward the lungs, it is humidified and tempered very nearly to the temperature of the body, so that it may not incite irritation in the lower air tracts. The action or influence of the inhaled air causes moisture (serum) to be formed on the mucous membrane of the nose, amounting to a pint or more in twenty-four hours, which is absorbed by the tempered and expanded air and carried to the lower air tracts where it is needed. The trachea and bronchial tubes having but few glands for the secretion of serum, are largely dependent upon this moisture to keep them in proper condition; the moisture in the nose also serves as a partial filter for the air that passes over it, arresting dirt and other injurious particles.

The healthy condition of the nose, its proper functional working and influence, depends therefore on the *continuous* passage of air through it, which is as necessary for the nose as is light for the development of the eyes and the preservation of their parts, and we know that if the eyes were deprived of light, they would deteriorate in every purposed function or influence.

Many persons breathe through the mouth and are not aware of it, because not watchful over their personal habits and their attention has never been called to it, and it may be suspected that many cases

of ear, throat, nose and chest troubles are consequent upon mouth breathing.

If one observes the people he meets on the street, he will be surprised to find how many have their mouths open and are unconsciously sowing the seeds of future distress.

A person who may discover himself to be a mouth breather should at once adopt measures to cure the infirmity. If the nose has some defect in conformation or is affected with adenoid growths that prevent the natural use of the nostrils, recourse should be had at once to a surgeon, who may be able, by a simple operation, to restore the breathing channel to a good working condition. If there is no defect or growth in the nose, it is pretty much in the hands of the person to bring about the needed relief, and this can be done by persistently keeping the mouth closed; not merely having the lips touch each other, but having the upper and lower teeth lightly touching and properly articulating, and deep breathing exercise should be practiced several times a day, and be continued from day to day until natural and easy breathing has been acquired. If, however, through some temporary impediment, the deep breathing can not be completely performed, then recourse should be had to taking *successive short sniffs* of air through the nose till the lungs are filled (usually ten sniffs or less, one to a second, will fill the lungs), then exhale slowly *through the nostrils.*

When one has a cold in the head and breathing is

difficult, there is a great temptation to breathe through the mouth; but the inclination should be resisted, and frequent resort be had to a gentle massage of the nose and entire head and neck, accompanied at intervals with forced nasal breathing—sniffing inspirations—so as to force open the air passages, and thus allay their inflammation through the restoration of their functions.

But if one does not resort to this remedy and yields to the inclination to breathe through the mouth, he aggravates the distemper, and may be laying the foundation for becoming a confirmed mouth breather.

It often happens that only one nostril is obstructed. In such cases press lightly with a finger against the other nostril to prevent air passing through it, so that the entire effort of forced inspiration and expiration may be confined to the obstructed nostril.

It may be that a nostril is obstructed without the knowledge of the person, the other nostril being apparently sufficient for needed breathing. It would, therefore, be advisable, especially when colds are prevalent, to occasionally try each nostril to see that both are performing their functions.

Cold in the head, with difficulty of breathing, is often treated by specialists with alkaline and astringent douches, and these are so convenient of application that many persons are led into their habitual use for self-treatment at home, whenever there is any feeling of obstructed breathing. The tendency of this frequent use must be toward injury of the

mucous and serum glands of the nose, and consequently an impairment of its functions in the economy of respiration.

It is important, therefore, to keep in mind the fact that the nose was intended to drink in air, not water, and this should impel one to keep at the forced breathing and massage even for an hour or more, until relief is obtained, rather than run the risk of probable serious injury to the breathing machinery through destructive douches.

CHILDREN—MOUTH BREATHERS.

Mouth breathing is a disease, or the symptoms of a diseased condition of some part of the breathing machinery. It may be congenital, but more frequently is a carelessly acquired habit of early childhood.

It often results in a drawing down of the facial muscles, a contraction of the upper jaw, a corresponding projection of the upper teeth, a nasal articulation, and a dreamy, troubled appearance of the eyes, and, sometimes, induces mental deterioration.

The constant watchfulness and admonition of a parent should prevent it, but the fact is that very often parents are the last ones to perceive an objectionable peculiarity in their children. They become familiar with it during its gradual development and so regard it as a harmless idiosyncracy, and, being familiarized to its daily presence, have no immediate anxiety as to an inevitable danger.

It should, therefore, be the duty of school teachers to supplement this ignorance or indifference of parents by their intelligence and habit of observation, and endeavor to correct, so far as possible, this evil habit where it exists in children under their charge. They will find this a fertile field for faulting, for probably a quarter or more of the school children one meets on the streets have their mouths open, many of them manifesting the indisputable physical signs of mouth breathers.

SNORING IN SLEEP.

A person who snores in sleep does so because his mouth is open and he is breathing through it (and not through his nose). Usually this occurs while lying on his back, and the lower jaw falls down by gravity, thus opening the mouth. A possible remedy is to lie habitually on the side, and when composing oneself for sleep to close the mouth, the tip of the tongue against the base of the upper front teeth, with intention fixed in the mind to keep it there during sleep. It would be well to form this habit for tongue by continual practice during the day, and the habit once fixed, a person with moderate sensitiveness would, during sleep, at once perceive if the tongue were to lose its touch, by reason of opening the mouth. It might be that frequent massage of the facial muscles would assist toward firming them and keeping the jaw closed.

But if the habit of mouth-breathing seems confirmed and beyond the influence of the will during the period of sleep, then recourse should be had to a small strip of court plaster placed over the lips, to hold them together in a natural position. To be worn while sleeping and continued for several weeks, until there is established the habit of breathing through the nose. The plaster need not be large, only of size sufficient to adhere well to the upper and lower lips.

It may at first be annoying, but time will make it less so, and anyhow the annoyance is as nothing when compared with the evil consequences of mouth breathing, such as catarrh, bronchitis, asthma, and other infirmities of the respiratory tracts.

EXERCISE AS A PREVENTIVE OF DISEASE.

"An ounce of prevention is worth a pound of cure."

The preceding exercises embrace but a small part of the movements that may be used for maintaining health. There are so many motions for preventing the muscles from lapsing into a condition of unserviceableness, that a treatise of reasonable size could hardly contain them; for every motion may be resolved into or connected with almost innumerable combinations. It seems advisable, however, to continue the subject along a line somewhat different from what has been previously touched upon in the Primer. Not for the purpose of expanding the list

of exercises, but with the object of impressing their need, and encouraging those of weak purpose to persevere in daily practice.

In addition to calisthenic exercise, there is essential need of daily exercise in the open air, and the healthiest are those who practice it.

Air, in the tightly built modern house, is always more or less impure, being mixed with contaminations proceeding from cellar, furnace, kitchen, gas arrangements, and various other belongings of the house, so that even where ventilation is at its best, there is some undesirable element present to adulterate and vitiate it. And so, without in the least detracting from the benefit of calisthenics in one's room, yet too much insistence can not be made as to the desirability of at least one hour daily walking exercise out-doors. And for the majority of people, it hardly matters how disagreeable the weather may be, there will be benefit from it.

Beside being more pure, the out-door air is usually colder than the in-door air, and when taken into the lungs has a greater expansive capacity than warm air, and thus exercises on the bronchial tubes and the lungs a force to expand them and enlarge their capacity for breathing; hence, we see that the modern successful treatment of lung troubles by physicians consists principally in exposure of the patient to cold, out-door air.

BENJAMIN FRANKLIN.

Among the men noted for practical sense in its application to the common concerns of life and rules of conduct, no one stands higher than Benjamin Franklin. He has no record as a gymnast, or as one skilled in strenuous physical performance; but all his life (he lived to be eighty-four years old) he was an advocate of exercise for the preservation of health, and he took notice of the comparative values of different kinds of exercise, as is shown in the following extract from a letter to his son dated London, 1772:

"In yours of May 14 you acquaint me with your indisposition. The resolution you have taken to use more exercise is extremely proper, and I hope you will steadily perform it. It is of the greatest importance *to prevent diseases,* since the cure of them by physic is very precarious.

"In considering the different kinds of exercise, I have thought that the quantum, or character, of each is to be judged by the degree of warmth it produces in the body. I have been ready to say (using round numbers without regard to exactness, but merely to note a great difference) that there is more exercise in riding one mile on horseback than five in a coach, and more in walking one mile than riding five on horseback. And I will further add, that there is more exercise in walking one mile up and down stairs than in five on a level floor. The two latter exercises may be had within doors when the weather discour-

ages going abroad, and walking up and down stairs (not running) may also be desirable when one is pushed for time, as containing a great quantity of exercise in a handful of minutes. The dumb-bell is another exercise of the latter compendious kind, by the use of which I have in forty swings quickened my pulse from sixty to one hundred beats in a minute, and I suppose the warmth of the body greatly increases with the quickness of the pulse."

Franklin was sixty-six years old when he wrote this personal experience. This was long before Ling gave to the world his system of gymnastics for developing the body and the treatment of ailments.

Continuing the approximate comparisons, it may be said that there is more exercise in walking one mile, taking long strides, than in walking two miles taking short steps; and more exercise in walking one mile, carrying a heavy cane to swing, by which both arms may be exercised, than walking two miles without swinging a cane or a closed umbrella, which will answer the same purpose.

WILLIAM CULLEN BRYANT.

An instructive example of the benefits to be derived from easy and simple exercises is shown in the life of William Cullen Bryant, who lived to eighty-four years. He was a great walker, made a daily practice of calisthenics with few or no appliances, and continued in practice almost to the day of his death,

which was the result of an accident. His sight and hearing were scarcely impaired at the age of seventy-seven, and he writes that he has reached a pretty advanced period of life without the usual infirmities of old age, and with strength, activities, and bodily faculties in good preservation. His biographer writes of him, "'Oh! good gray head, that all men know!' rose unbidden to one's lips as he passed his fellow pedestrians in the streets of the great city, active, alert, with a springing step and urgent gait, as seen in all weathers walking down to his office in the morning, and back to his house, three miles distant, in the afternoon, an observant and observed antiquity."

Others of world fame could be mentioned. John Wesley, who lived eighty-eight years, preached exercise, plain diet and temperance. Vanderbilt, Palmerston, Thiers, who, though immersed in weighty business cares, yet had the inclination and found the time to keep on training their physical activities up to the termination of their long lives.

These men should be exemplars for the man of middle age and of more advanced years, who may have allowed the cares of business to engross his thoughts and has not given heed to the needs of exercise; has never walked when he could ride, and never stood when he could sit; whose joints have become stiff and all ease or grace of motion been lost, and has inertly settled down into the belief that his infirmities are the inevitable inheritance of old age,

and that there is no remedy or alleviation for them. But in this thought he may be mistaken. There is an old adage: "'Tis never too late to mend," and there is always hope that there still remains a remnant of recuperative force, and he may be able, by the exercise of patience and resolution, to restore to life the neglected joints and muscles, or at least regain a somewhat more healthful circulation of vitalizing blood, and thus assist toward a more comfortable existence.

EXERCISE AS A REMEDIAL AGENT.

Referring to the many beneficial effects of massage, as enumerated on page 9, the following is excerpted: "The movements properly used affect both the superficial and the deep tissues, and *pain is thereby soothed.*"

As a remedial agent for the removal of pain or treatment of a lesion, it is recommended that the entire series of exercises be used, so as to influence the circulation throughout the body, and to recur often to those exercises that particularly affect the body in the neighborhood of the pain or lesion. For example, a headache having its origin in indigestion can often be alleviated or dispelled by the use of all, or most, of the prescribed exercises, having frequent recurrence to those for the head, the neck, the arms, and the abdomen. Three-quarters of an hour, or may-

be less, of the exercise will usually banish a headache of such a character.

Congestion of the blood in a part is a fruitful source of pain, and the usual remedy is to induce circulation at the place of pain by the use of fomentations, gargles, liniments, plasters, blisters, and cautery. It may not be claimed that calisthenic-massage will, in all cases, prove a complete substitute for blisters, etc., but its use is certainly in the right direction, and may often obviate the need of having recourse to a remedy more severe or less convenient.

In one of the "Arabian Nights Tales" is a story of how the Sultan, being ailing, his physician hollowed out receptacles in a pair of Indian clubs, in which he enclosed and sealed up some mystical drugs, and directed the Sultan to exercise with them every morning and get into a profuse sweat, then the medicaments would exert their healing power through the pores of the wood and permeate through his body. The Sultan was thus inveigled into taking needed exercise, and was cured.

There are many persons who are troubled with some local derangement or weakness of the body, and these should, when practicable, and when permitted by a physician, use the exercises *several times a day,* especially the exercises that tend to restore or increase the circulation at the deranged part. It may probably be the experience of the performer that the exercise will be followed by an increase of pain in the morbid part, and this may be a natural conse-

quence of the increased flow of blood through the veins, arteries, and muscles that have been for a long time in a condition of partial atrophy or paralysis, and so they do not readily accommodate themselves to the unusual pressure caused by the increased and more rapid flow of blood through them. This accession of pain, should not, therefore, be necessarily regarded as an evil and cause an abandonment of the exercise, but should usually be taken as evidence that good is being accomplished, and be an encouragement to continued effort, until there is restored, as far as possible, a normal condition of the part, which can be brought about only by inducing a natural flow of vitalizing blood to nourish it.

Many years ago I had a severe attack of rheumatism and went for treatment to a sanitarium in Canada, where were probably the best equipped Turkish and other baths then existing on this continent. The attending physician, a skillful doctor of the regular school, ordered for my daily treatment a Turkish bath at six o'clock in the morning, and a hot or cold salt-water bath in the afternoon. But in about ten days of treatment I told the doctor that the rheumatism was worse than ever, the pain so great that I could not sleep at night; but the doctor only laughed at me and said it was evident the treatment was doing me good and must be continued. The result was that after a while the pains ceased, and at the end of five weeks the rheumatism had entirely gone, and since then has returned only at long intervals, in an

attenuated way as a mild reminder of a long-ago intimate acquaintanceship.

It is well to add that all the rheumatic patients in the sanitarium with whom I talked on the subject had a like experience of excruciating pain accompanying the recovery period. This is in accord with Shakespeare:

> "Before the curing of a strong disease
> Even in the instant of repair and health,
> The fit is strongest; evils that take leave,
> On their departure most of all, show evil."

The treatment did not involve the taking of any drugs or dieting. Heat and cold were the only agents, and now looking back it seems that the rationale of the treatment was the inducing of the circulation of the blood, directly by warmth, indirectly by the reaction from cold, and the pain that followed was evidently by reason of the restoration of circulation in the morbid parts where it had been impeded. A persistent course of exercise at home would probably have been as curative as the baths, more convenient and less expensive.

The number of counts during a movement has usually been prescribed as 5, but there may be individual reasons for counting a greater number in some movements. The observant person should be guided in this by his experience as to whether the exercises when completed in, say, twenty minutes, produce an

agreeable feeling or a feeling of weariness and lassitude, making a proper distinction between being weary and being tired; for to be moderately tired is beneficial. Weak and ailing people should at first take the exercises in an easy way and not to the extent prescribed, and increase them in duration along with gain in strength and facility of performance.

Dryden, in a letter to his brother, writes:

"Better to range the fields for health unbought,
Than waste your money on nauseous draught.
The wise for cure on exercise depend."

MODERATION IN EATING.

"A wise man eats to live;
A foolish man lives to eat."

SOCRATES.

"Be not insatiable in any dainty thing, nor too greedy after meats, for excess of meats brings sickness. Many have perished by surfeiting, but he that is careful prolongeth his life."

"Sound sleep cometh of moderate eating;
He riseth early and his wits are with him."

ECCLESIASTICUS.

The most prevalent injurious practice among men is the eating of food in excess of the requirements

of the body, and of a kind not suited to the daily life of the individual, *and in this way the benefit of exercise may be wasted or made of little account.*

A book has lately been published, entitled "The A. B. Z. of Our Own Nutrition," by Horace Fletcher. It abounds in sense, and most every one could profit by reading and adopting its teachings. It commences with the question, "Do we eat too much?" The writer answers emphatically in the affirmative, and says that nine out of ten physicians will say the same. He mentions the well-known case of Louis Carnaro, an Italian of noble family, who lived more than three hundred years ago; he was a dissipated wreck at the age of forty, then reformed his habits of living and became an apostle of very moderate eating. He claimed that men ate twice as much as was necessary, and that excess of food is the foundation of most of the diseases that afflict us. He was past one hundred years when he died, having practiced abstemious living for sixty years.

The author adopts the teachings of Carnaro, and claims to have discovered, through his personal experience, a way how not to eat too much, at the same time eating all that the appetite desires. The method used by him consists principally in grinding and dividing the food by the teeth, and its thorough mastication in the mouth before allowing it to be swallowing. By following this method, nature will declare when the appetite has been appeased, a less quantity of food will be required to satisfy hunger,

also a less time for eating, and thus the digestive machinery will not be taxed to dispose of a mass of material not needed for nutrition. He insists that everything taken into the mouth, except water, should be *chewed and moved about by the tongue,* in order to thoroughly mix it with the saliva of the mouth, before being swallowed. This includes even spirits, tea, coffee, chocolate, milk, soups, etc., etc. For this reason all liquid, soft or emulsion foods should be taken into the mouth a little at a time.

Mr. Fletcher does not advocate any special kinds of foods, and, provided there is a thorough mastication of it, he leaves the selection pretty much to desire or craving, guided by the judgment of the individual, based on personal experience; but there are certainly some foods that should be distrusted by all who do not earn their bread by the sweat of the brow, who exercise but little or only moderately. Among these foods may be mentioned pies, buckwheat cakes, and fresh pork.

Mr. Fletcher's theories and their exposition have the support of many scientists who make a study of nutrition and impart the lesson to be heeded daily—check impulse, control appetite, and be not like Rip Van Winkle, who never resisted occasion to "treat resolution," putting aside his pledge of abstinence with the beguiling phrase, "This time don't count." "Be wise to-day; tis folly to defer."

One thing indicated in the book, but not sufficiently emphasized, is that in order to enjoy or relish the

natural or complete taste of a food, it should be eaten by itself. That is, there should not be in the mouth at the same time undergoing process of mastication, a variety of foods, the taste of one obscuring or neutralizing the taste of another. Beside the obscuration of flavor, there is the further objection that foods have different degrees or form of structure and cellular tenacity, and so require different periods for complete mastication in preparation to be swallowed. Therefore, it seems reasonable that meals should be in courses of only one dish at a time; but as this would usually be inconvenient or impossible, the next best resort would be that one take on his plate only one food at a time, and when that is eaten, take of another dish. In this way each article of hot food may be kept hot in its covered dish and is more enjoyable for eating, and the enjoyment of food aids in its *nutritive effect*—one is thus inclined to eat a less amount.

Interesting and valuable experiments in dietary were made during a period of six months from October, 1903, to April, 1904, at New Haven, Connecticut, under the supervision of Professor R. H. Chittenden, Director of Sheffield Scientific School, Yale University. The experiments were made with a volunteer detail of U. S. hospital men, thirteen in number; a group of eight Yale students, athletes of high standing; Professor Chittenden, and a group of five professional men connected with Yale.

The purpose was to ascertain, as accurately as ex-

periment could determine, what should constitute a proper dietary, so far as general principles were involved, for men in different conditions of life and habituated to different degrees of activity. And especial attention was given toward ascertainment of the amounts of proteid and calorific foods necessary for the maintenance of health and strength.

Professor Chittenden had the advantage of a full staff of experts to assist him in his investigations, and every effort seems to have been made to insure the experiments being as complete and exhaustive as possible, and the deductions therefrom are probably the most reliable that ever have been derived in the line of like research.

An account of the experiments, with tabulated data of various kinds, has been published in a book of 478 pages, entitled "Physiological Economy in Nutrition." The deductions of professor Chittenden are carefully and conservatively stated, and his unavoidable conclusion from the daily recorded data is that an excess of food, especially albuminous food (such as meat, poultry, fish, eggs, milk, cheese, beans, peas) is consumed by almost everyone; that this kind of food could be advantageously diminished for the majority of people by at least one-half, and this without any considerable increase in the intake of succulent vegetables, carbo-hydrates, or fats (such as starch, sugar, butter, etc.); and, furthermore, that this fifty per cent. diminution of albuminous food can be made while maintaining the body in perfect

physical and mental condition, and, in fact, the outcome of the experiments compelled the belief that physical and mental conditions were improved by the diminution. It was observed that there resulted increased strength and power of endurance, and a less sense of fatigue after severe exercise.

The author mentions several persons, under the experiments, affected with troubles of a rheumatic or gouty nature, who gained entire and permanent freedom from the symptoms.

It is to be noticed that the experiments embraced the cold months of winter and the two preceding months, when, according to popular notion, generous proteid and heat-producing diets are needful for fortifying the system against the cold periods.

Making deduction based on his experiments, the author says: "It is obvious that the smallest amount of food that will maintain body and mental vigor and preserve the normal process of resistance to disease, is the ideal diet. Any excess over and above what is needed for these purposes imposes just so much unnecessary strain upon the organism, entailing a wasteful expenditure of physical and nervous energy that should be conserved for needful purposes—such excess especially imposes on the excretory organs a more or less exhaustive labor of removing increased waste products, to say nothing of the possible toxic action of these products as they circulate through the system."

"*Physiological economy* is not prohibition of any

particular kind of food, but it means temperance, discrimination, and self-control in use, and it also means, in result, greater freedom from many diseases in which special organs, such as the kidneys and liver, are frequently involved, and through these the general health endangered."

"The question of daily diet, in its relation to *domestic economy,* is of great importance for persons of small or moderate means. There is no reason why the family purse should be drained for supplying imaginary wants, and this with so many hurtful consequences."

It is apparent, from the plentiful data, that it would be quite safe to diminish, by at least one-half, the amount of proteid food, and by one-third the amount of calorific food ordinarily consumed, not only without detriment, but with gain to health and comfortable feeling, and a saving in money expenditure.

Economy is *respectable and commendable* in all the affairs of life, public and private. Wastefulness is just the reverse, and it would become people in all walks of life to restrict their dietary to the reasonable physical demands that will insure health, strength, sense of well-being, and probably long life.

Professor Chittenden's experiment on himself is interestingly narrated. The experiment commenced November, 1902, age 47, weight 143 pounds; was finished in July, 1903; his weight then was 128 pounds, a loss of fifteen pounds. He had been ac-

customed to eating daily an amount of food approximately equal to popular dietary standards, but gradually each day he reduced the amount of food, especially proteid food, and in the course of a couple of months abolished breakfast, except the taking of a small cup of coffee; took a light lunch at 1:30 p. m., and a larger amount for dinner at 6:30 p. m. At first the change to a smaller amount of food was attended with some discomfort, but this soon passed away, and he felt that his physical condition was unquestionably improved. A rheumatic trouble in the knee-joint, which had persisted for a year and a half, not yielding to treatment, entirely disappeared and has not returned. Sick headache and billious disorders no longer made their periodical attacks; a keen appetite, a more acute taste, and a thorough liking for simple foods, were developed.

Two months in summer were passed at a Maine fishing resort, and frequently he would row a boat six or ten miles in a forenoon, sometimes against a head wind—this on an empty stomach. From such experience he reasoned that when we may have freed ourselves of the habit of taking a hearty breakfast, work, both physical and mental, will be accomplished with greater efficiency, comfort, and satisfaction. The diminished amount of proteid food lessened the occasions of thirst, less water was drank, the kidneys having less work to do, required less water to flush them. During this time there was no attempt to restrict to any special diet; the dictates of appetite,

within the bounds of reason, were followed, but excess was avoided.

Professor Chittenden claims that during the experiment he did more work, and led a more active life in every way, with greater comfort and less fatigue than usual, and was in the best of health, which continues to the present time. His system has become so accustomed to the new habit of nutrition, that he has no inclination to return to the more liberal dietetic habits of former years.

In regard to the group of eight Yale students, the following is an abridgement of the report concerning them made by Dr. Wm. G. Anderson to Professor Chittenden. He gives some personal account of each, and states that they were in "training form" when they began the change in diet, that they were then in constant practice, and in the pink of condition, viz.:

G. W. Anderson—Age 26; foot-ball, baseball and basketball player, as well as "crew man."

W. Y. Anderson—Age 21; a "Y" athlete, hurdler; captain of the Yale gymnastic team; University gymnastic champion, and American gymnastic champion. He won these championships while under the restricted diet.

H. S. Bellis—Age 26; member of Y. G. A.; a gymnast and acrobat.

Dr. W. H. Callahan—Age 27; medical assistant at the gymnasium; practiced in bowling, handball, and running.

M. Donahue—Age 25; a very muscular and versatile athlete, football and basketball player.

C. S. Jacobus—Age 22; a "Y" athlete; a noted long-distance man; one of the best University runners.

R. H. Schenker—Age 22; an active member of the Y. G. A.; a point winner, and inter-collegiate competitor in gymnastics.

John Stapleton—Age 24; a wrestler and gymnast; a professional; a man of large body and great strength.

It is apparent from the descriptions that these were not weaklings, nor decayed gymnasts blase in appetite, nor faddists working up a theory of living; but they were as sinewy, hardy and vigorous a collection of young men as can anywhere be found, wholesome in every way, mentally and physically.

The experiments with these young men show that athletes, accustomed to vigorous work, can satisfy body needs and maintain physical strength, as well as a capacity for mental work, with one-half or one-third the amount of proteid food ordinarily consumed by men of this class, and generally that the athlete or the professional man can meet all his ordinary requirements with a consumption of proteid food much less in quantity than is usually consumed, and this without measurably increasing the amount of other kinds of foods.

The result of the experiments with the hospital detail and the deductions therefrom, coincide with what has been written concerning the two

groups. The men commenced their tour with a full diet of meat and other foods such as they had been accustomed to, and gradually reduced it by one-half or one-third. Exercise in the gymnasium was daily practiced, and health and strength were maintained and acquired under the regimen, and at the termination of their detail they expressed themselves as pleased with their experience, and offered their services for future experimentation in case they should be needed.

The experiments of Professor Chittenden afford encouragement to anyone who is convinced that his daily intake of food, especially proteid food, is excessive, and desires to diminish the amount; but such person, in entering upon the undertaking, must observe caution that the habits of a lifetime be not changed in a day or a week, but done gradually and watchfully, not arriving at the stage of full dimunition under a period of one or two months. The daily status as shown by symptoms should be the guide in determining the progress or rate of diminution.

QUOTATIONS.

"If the gratification in indulgent eating were a lasting one, we might have some patience with those who so readily yield to it; but *the pleasure is short—no sooner begun than ended—while the many infirmities that proceed from it are of long duration.* On the other hand, the man who restrains and limits his

desire has the satisfaction of knowing that his restraint will not result in sickness or any infirmity, but will conduce to his health, comfort, and longevity." LOUIS CARNARO.

"Wouldst thou enjoy a long life, a healthy body, and a vigorous mind, labor in the first place to bring thy appetite to reason."

BENJAMIN FRANKLIN.

"If thou will observe the rule of 'not too much' in what thou eatest and drinkest, by temperance taught, seeking from thence nourishment, not gluttonous delight, so mays't thou live till, like ripe fruit, thou drop into thy mother's lap." MILTON.

"He that ruleth his spirit is better than he that taketh a city."—Proverbs.

"Restrain today, and that shall lend a kind of easiness to the next abstention, then next more easy."

SHAKESPEARE.

"Physic is usually a substitution for exercise or temperance, the refuge of the idle and the intemperate, an expedient to combat the evils of surfeit while countermining the foundations of health."

ADDISON.

"Accuse not Nature, she hath done her part. Do thou but thine." MILTON.

"This much is certain, that probably thirty per cent. of the persons who consult physicians owe their ailments in some way to food or its excess, and in many cases they are aware of the fact, but make effort to blind themselves to its existence, or conceal it from the physician whom they consult, and to whom they are professing perfect openness."—Parkes' Hygiene.

L'ENVOI.

We read in "The Book," "All that a man hath will he give for his life," but mere existence does not comprise the full measure of the capacity of life, and all of us can make our living better and more enjoyable by giving greater attention to the physical needs of the body, so that none of its functions shall be carelessly impaired, but all be so regulated that they will work together in harmonious accord, with the prospect, or almost certain anticipation, that the span of life will thereby be extended, and the usual infirmities of advanced age be largely diminished and modified in their rigor, and so when at last fully matured as a shock of corn in its season the summons comes to join the great majority "Over the Bar," it may be hoped that the answering *adsum* will be as ready as if responsive to a call to peaceful slumber and pleasant dreams.

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